

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to apparatus for Practising and Teaching Expired Air Artificial Respiration

We, THE BRITISH OXYGEN COMPANY LIMITED, a British Company, of Hammersmith House, London, W.6, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

In recent years there has been added to the already well known methods of artificial respiration a further method known as the Expired-Air Method of Artificial Respiration. According to this method the patient preferably lies on his back, with his head held back, and the person offering assistance places his mouth over the mouth or nose of the patient. Air is then forced into the patient's lungs to expand them, the nose or mouth, respectively, of the patient being gently squeezed to close it during this operation, and a period of about three to four seconds is then allowed for the air to be expelled again by the natural collapse of the patient's chest. This process is then repeated until such time as the patient is capable of breathing for himself.

The method has been used successfully in so many instances that it has become accepted by controlling bodies concerned with teaching those persons associated with first aid, ambulance corps, life saving groups at swimming pools and coastal resorts, and many allied associations and professions. The method, for best results, should be carefully taught to ensure that the patient is suitably prepared or arranged for treatment, and that the timing and strength of the air transfer periods are correctly timed and applied. This aspect of the method, at present, constitutes a considerable drawback to the teaching of the method since mock patients are naturally reluctant to permit others to blow air into their lungs, and personal contact orally may transmit infection.

It is an object of the present invention to provide means whereby a live mock patient [Price 4s. 6d.]

can permit himself to be used for practice purposes of expired-air artificial respiration in the knowledge that he will not be forced to accept the air that is exhaled by others, and there will be no oral contact.

According to the present invention an apparatus is provided for practising or teaching expired-air artificial respiration comprising a unit having a mouthpiece and associated nostril-representing-aperture for use by a first person practising this method, first passage means connecting the said mouthpiece and associated nostril-representing-aperture, support means whereby the unit may be supported above the mouth of a second person in supine position acting as patient by the head of the said second person, an inflatable bag simulating a lung, second passage means placing the mouthpiece and associated nostril-representing-aperture in communication with the said inflatable bag, and constricting means mounted on the unit and adapted to guide the second passage means towards the neck or chest of the second person in such a way that the second passage means is constricted by bearing against the body of the second person if the second person in supporting the unit does not have his head tilted to the correct position in relationship to his body for expired-air artificial respiration, the constricting means being ineffective to cause constriction of the second passage means when the head of the said second person is correctly tilted.

The constricting means may be formed of substantially rigid material and be rigidly attached to the support means.

The support means may include a lower mouthpiece to which the constricting means is rigidly attached, adapted to be gripped in the mouth of the second person and having a passage communicating with the atmosphere through which the second person may breathe.

The present invention will be more clearly understood by reference to the following des-

cription taken in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view of one form of apparatus in accordance with the present invention, and

Figure 2 is a sectional view of part of the apparatus shown in Figure 1.

An upper mouthpiece 1 is formed from the neck of a conventional rubber hot water bottle having a flexible bell portion 2 formed with an apertured hanging tag 3 and a hard core 4 which would normally receive a bung or the like in an aperture 5.

The space within the bell portion is isolated from the aperture 5 by a rubber diaphragm 6 secured with a suitable adhesive, e.g. rubber solution, and the aperture 5 receives from below an apertured stem 7 of a conventional rubber "snorkel" mouthpiece 8 hereinafter referred to as the lower mouthpiece having teeth grips 9, on one of which is shown in Fig. 2. A side hole 10 is bored through the hard core 4 and the stem 7 to communicate with the aperture 11 therein.

Two blind holes are also bored into the hard core from the opposite side thereof from the hole 10 and these blind holes receive the two ends of a generally U-shaped rigid wire frame 12. The arms of the U are generally parallel and extend from the hard core in generally horizontal reaches 13 which join sloping reaches 14 inclined downwardly and away from the hard core. The sloping reaches then join generally vertical reaches 15 which are finally joined together by an upwardly crooked connecting portion 16.

On the same side of the bell portion of the upper mouthpiece as the tag 3 is bored a hole 17 and this hole and the aperture 18 in the tag are connected with a suitable adhesive, e.g. rubber solution, by a piece of rubber tubing 19 hereinafter referred to as the "nose" tube and constituting first passage means. On the opposite side of the bell portion a further hole 20 is bored from which extends a long piece of rubber tubing 21 constituting second passage means secured by means of a suitable adhesive, e.g. rubber solution, and hereinafter referred to as the "trachea" tube which is connected with a Y-junction piece 22 leading to two inflatable rubber bladders, balloons or disposable bags 23 hereinafter referred to as "lungs". Beside the hole 20 is a further smaller hole from which extends a further long piece of tubing 24 again secured by a suitable adhesive, e.g. rubber solution, and hereinafter referred to as the "gullet" tube and leading to a third inflatable rubber bladder, balloon or disposable bag 25 hereinafter referred to as the "stomach".

The "trachea" tube 21 is secured behind and between the arms of the frame 12 by means of adhesive tape 26 or other suitable means at points on the sloping and generally vertical reaches 14 and 15 of the frame and

is trained under the portion 16 of the frame. The "gullet" tube 24 is secured alongside the "trachea" tube by the adhesive tape 26 on the sloping reach 14 of the frame but is otherwise free.

In expired-air artificial respiration it is necessary for a patient in a supine position to have his head placed back away from his chest in order to avoid constriction of his trachea by virtue of his tongue blocking his throat. Furthermore, in mouth-to-mouth artificial respiration it is necessary to close the patient's nostril's either by pinching his nose or by placing one's cheek over his nostril's. Likewise, in mouth-to-nose artificial respiration it is necessary to close the patient's lips. The apparatus described is designed to give to a person being taught such artificial respiration the illusion of reality and to impress upon him the necessary precautions mentioned above.

In use, a mock patient is in the supine position with the lower mouthpiece 8 in his mouth, the rigid wire frame over his chin and the "lungs" and "stomach" 23 and 25 lying appropriately. Realism is achieved by placing a blanket or coat over the "lungs" and "stomach". If the mock patient's head is not sufficiently tilted back the "trachea" tube 21 is constricted under the portion 16 of the rigid wire frame and consequently the "lungs" 23 cannot be inflated. Thus, before using the apparatus care is taken to maintain the "trachea" tube unconstricted by tilting back the mock patient's head sufficiently.

A person teaching, being taught or practising the kind of artificial respiration with which the invention is concerned kneels down beside the head of the mock patient, and, in the case of mouth-to-mouth artificial respiration, places his mouth against the upper mouthpiece. As will be evident, in order to inflate the "lungs" and the "stomach" the "nose" tube 19 must be closed since otherwise exhaled breath entering the bell portion 2 would simply escape through the "nose" tube. The "nose" tube can be closed either by pinching same or by the person placing his cheek against the aperture 18.

Likewise, in the case of mouth-to-nose artificial respiration where the person blows into the aperture 18, in order to inflate the "lungs" and "stomach", the rim or "lips" of the bell portion 22 must be pinched so as to prevent exhaled breath escaping therethrough.

In either mode of use the person using the apparatus inflates the "lungs" and, sometimes, "stomach" and then allows the "lungs" to become deflated, the "stomach" being deflated by hand, while observing the consequent rise and fall of the blanket or coat covering the "lungs" and "stomach". The effect obtained is most realistic and the apparatus quickly teaches a person using it to develop a respiratory and, if necessary, hand pressure

rhythm suitable for use in giving artificial respiration to an asphyxiated patient. It will be noted also that the person using the apparatus makes no oral contact with the mock patient and neither accepts the exhaled breath of the other. The mock patient is at liberty to breath directly through his nose or through his mouth via the side hole 10 and the aperture 11. Furthermore, in the interests of hygiene, the "lungs" and "stomach" may be, as stated above, disposable bags which can be replaced after use of the apparatus by one operator so that the next operator does not inhale any exhaled breath of the previous operator residual in the used bags.

The mouth unit comprising upper and lower mouthpieces may be constructed in any other suitable manner than that described and, instead of rubber, it may be made of any other suitable material such that it can be easily disinfected.

As an alternative to making the lower mouthpiece in the form shown it can be replaced by a mask adapted to be held over the mouth of the person acting as the patient and covering a part or the whole of the face of such person.

If desired the bag 25 can be omitted from the apparatus. Furthermore, the two bags 23 can be replaced by a single inflatable bag.

WHAT WE CLAIM IS:—

1. Apparatus for practising or teaching expired-air artificial respiration comprising a unit having a mouthpiece and associated nostril-representing-aperture for use by a first person practising this method, first passage means connecting the said mouthpiece and associated nostril-representing-aperture, support means whereby the unit may be sup-

ported above the mouth of a second person in supine position acting as patient by the head of the said second person, an inflatable bag simulating a lung, second passage means placing the mouthpiece and associated nostril representing-aperture in communication with the said inflatable bag, and constricting means mounted on the unit and adapted to guide the second passage means towards the neck or chest of the second person in such a way that the second passage means is constricted by bearing against the body of the second person if the second person in supporting the unit does not have his head tilted to the correct position in relationship to his body for expired-air artificial respiration, the constricting means being ineffective to cause constriction of the second passage means when the head of the said second person is correctly tilted.

2. Apparatus as claimed in Claim 1, wherein the constricting means is formed of substantially rigid material and is rigidly attached to the support means.

3. Apparatus as claimed in Claim 1 or Claim 2, wherein the support means includes a lower mouthpiece to which the constricting means is rigidly attached, adapted to be gripped in the mouth of the second person and having a passage communicating with the atmosphere through which the second person may breathe.

4. Apparatus for practising or teaching expired-air artificial respiration substantially as hereinbefore described with reference to the accompanying drawings.

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